5

Gypsy Moth Manual

Survey Section

Other Survey Tools

Contents

Introduction

This subsection contains information on survey methods that do not use pheromone traps.

Specifically, this subsection covers procedures for two survey methods:

- Egg-mass surveys
- Larval trapping surveys

Egg-mass surveys and larval trapping surveys are often done to supplement an adult trapping survey and confirm that reproducing populations are present.

Egg-mass Survey

Purpose of Egg-mass Surveys

Egg-mass surveys are done for several reasons:

- To confirm an infestation by providing convincing evidence (egg masses) that reproduction has occurred
- To determine the population level in a specific area so that the status may be changed (examples: non-infested to Transition Area; Transition Area to generally infested Regulated Area)

- To determine the population level near a high-risk site so that the correct control and/or regulatory actions can be applied

When to Survey

The best time to conduct an egg mass survey is after leaf drop; however, egg-mass surveys can be done anytime after the females have finished depositing eggs. A preliminary survey may help to determine if the females are present and laying eggs; the buff egg masses and the white female moths are easy to see on tree trunks and branches.

Where to Survey

Egg-mass surveys, which involve the counting of egg masses, are useful in areas that have moderate or high levels of infestation.

Egg-mass surveys are particularly desirable when (1) egg masses are the only life stage present, (2) survey results are needed immediately, as for treatment decisions, and/or (3) populations are high enough to make the effort worthwhile.

Usually, egg-mass surveys will not detect low-level populations with reliability; therefore, egg-mass surveys are of limited value in areas with low-level populations. (Larval trapping is a better survey method in areas which have light levels of infestation.)

Egg-mass surveys in the following areas are most likely to be detect infestations:

- Areas with preferred hosts
- Areas where contacts suspect possible introduction, because of observed defoliation, sightings of females, or some other indicator
- Areas where numerous household moves occur
- Areas where establishments receive Regulated Articles
- Areas close to known infested areas, particularly those areas where traps catch numerous moths
- Areas adjacent to and downwind from known infested areas
- Areas downstream from known infested areas
- Areas, such as Federal and State parks, used by recreational vehicles

How to Survey

A well-established infestation may exist even though few, if any, egg masses are easily seen. Therefore, surveyors must know the characteristics of the egg-masses and the preferred egg-laying sites.

Appendix B has information on the characteristics of the egg masses.

Preferred egg-laying sites are in the following locations:

- On tree trunks in sheltered spots, such as under limbs
- In bark cavities, under loose bark, and in bark crevices
- On logs - including firewood
- On signs
- On the underside of rocks not tight to the ground
- On stone walls and in the crevices of stone walls
- On branches on the ground or on the underside of any type of ground litter, such as tin cans
- Under the siding and eaves of buildings
- On Outdoor Household Articles (OHAs), such as birdhouses and picnic tables

In fact, egg masses may be found anywhere near trees in areas with preferred hosts.

Larval skins and pupal cases may be found even when egg masses are not.

Basic Procedures for Egg-mass Surveys

The following sections discuss the three basic procedures for egg-mass surveys:

- Egg-mass surveys using targeted visual surveys (transect surveys)
- Egg-mass surveys using small plots
- Egg-mass surveys using the general observation technique

Egg-mass surveys for regulatory purposes are usually targeted visual surveys.

Egg-mass Surveys Using Targeted Visual Surveys (Transects)

Targeted Visual Surveys (transects) examine an area of 50 ft by 20 ft, ten feet on either side of a 50-foot centerline. The total area examined is 1,000 ft^2, roughly equivalent to the 1,089 ft^2 in the 1/40 of a acre plots in the next technique.

Before the egg-mass survey, do the following:

1. Know how to identify and locate the egg masses.
2. Select the sites where gypsy moth egg masses are most likely to be. (Use the criteria on the previous page.)
3. Inform others of your intended survey area.

Procedure for the Targeted Visual Survey

At each survey site, do the following:

1. Select an object, such as a tree or rock, 50 feet away.
2. Walk slowly toward the selected object, scanning 10 feet to each side, in front, and overhead. Examine all preferred egg-laying sites. (See previous page.)
3. Count all egg masses seen.
4. Record all critical information, such as number of egg masses, site, method, and date of survey.

Egg-mass Surveys Using Small Plots

Before the egg-mass survey, do the following:

1. Know how to identify and locate the egg masses.
2. Plan to place plots at the sites where gypsy moth egg masses are most likely to be. (Use the criteria on **page-5-2**.) Plots must be at least 300 feet apart. If circular, the plots will have a radius of 18.6 feet; therefore, they will be 1/40 of a acre (1,089 ft^2).
3. Prepare a stake which will be driven into the center of the circular plot; this stake will have a radius-marking line of 18.6 feet attached. With its attached line stretched, this stake will help locate points within, on, and outside the circumference of each plot. (If four additional stakes are placed, equidistant, on the circumference, these stakes with the center stake will form quadrants.)
4. Inform others of your intended survey area.

Procedure for the Small-plot Egg-mass Survey

At each survey site, do the following:

1. Place the stake in the center of the plot.
2. Use the attached line to establish the circumference of the plot (or boundary of the quadrants).
3. Examine the plot (or quadrant). Start on a known radius and work around the circle. Scan in front, to the sides, and overhead. Examine all preferred egg-laying sites (See **page-5-3**.)
4. Count all egg masses seen.
5. Record all critical information, such as number of egg masses, site, method, and date of survey.

Egg-mass Surveys Using the General Observation Technique

Before the egg-mass survey, do the following:

1. Know how to identify and locate the egg masses.
2. Select a positive trap (or select an area suspected of being infested) as a starting point.
3. Arrange to have additional help to speed the survey.
4. Inform others of your intended survey area.

Procedure for the General Observation Technique

At each survey site, do the following:

1. Start at the positive trap (or within the area suspected of being infested).
2. Examine transit lines placed on the main compass points (north, northeast, east, southeast, south, southwest, west, and northwest). Examine all preferred egg-laying sites (See **page-5-3**) out to a distance of 0.5 miles.
3. Count all egg masses seen.
4. Record all critical information, such as number of egg masses, site, method, and date of survey.

No more than two days should be spent at any one site unless unusual circumstances warrant a longer evaluation time.

Egg-mass Surveys for Regulatory Purposes

Typically eggs-mass surveys for regulatory purposes are done in areas surrounding establishments handling Regulated Articles. These surveys allows the environs of the establishments to be examined.

The following environs are of particular interest:

- Forest edges near nurseries
- Forest edges near mills
- Forest edges near Christmas tree plantations
- Areas in and around campgrounds

Each egg mass survey for regulatory purposes will provide information to guide quarantine decisions for the establishment handling the Regulated Articles. Typical quarantine decisions are the following:

- Is gypsy moth present in the environs of the establishment?
- If gypsy moth is present, do the environs of the establishment need to be treated?

Before the survey, know what egg masses look like and where to find them.

To assess population levels at each survey site, use the targeted visual survey method to survey for egg masses. Walk in areas with preferred host trees, if possible.

Procedure for the Survey for Regulatory Purposes

1. Begin the survey in areas that are of importance (forest edges, campgrounds, campground edges).
2. Select an object, so that the walk will transect an area with preferred hosts
3. Walk slowly toward the selected object, scanning in front, to the sides, and overhead. Examine all preferred egg-laying sites (See Page 5-4).
4. Count all new egg masses seen.
5. Record all critical information.
6. Repeat above steps as needed in the environs of the establishment.
7. Determine the appropriate regulatory action.

Larval Trapping Survey

Purpose

Larval trapping has several uses:

- To determine the presence or absence of a reproducing population
- To assess gypsy moth larval development
- To determine where and when to apply control methods (chemical or behavioral methods for eradication)
- To evaluate treatments
- To contribute to research (contributions to research are not funded by PPQ)

If desired, use larval trapping along with or in place of egg-mass surveys to determine an area to be treated.

Larval trapping takes advantage of the fact that later instars seek hiding places. The larval trap offers an artificial hiding place for the larvae (**Figure 5-1**).

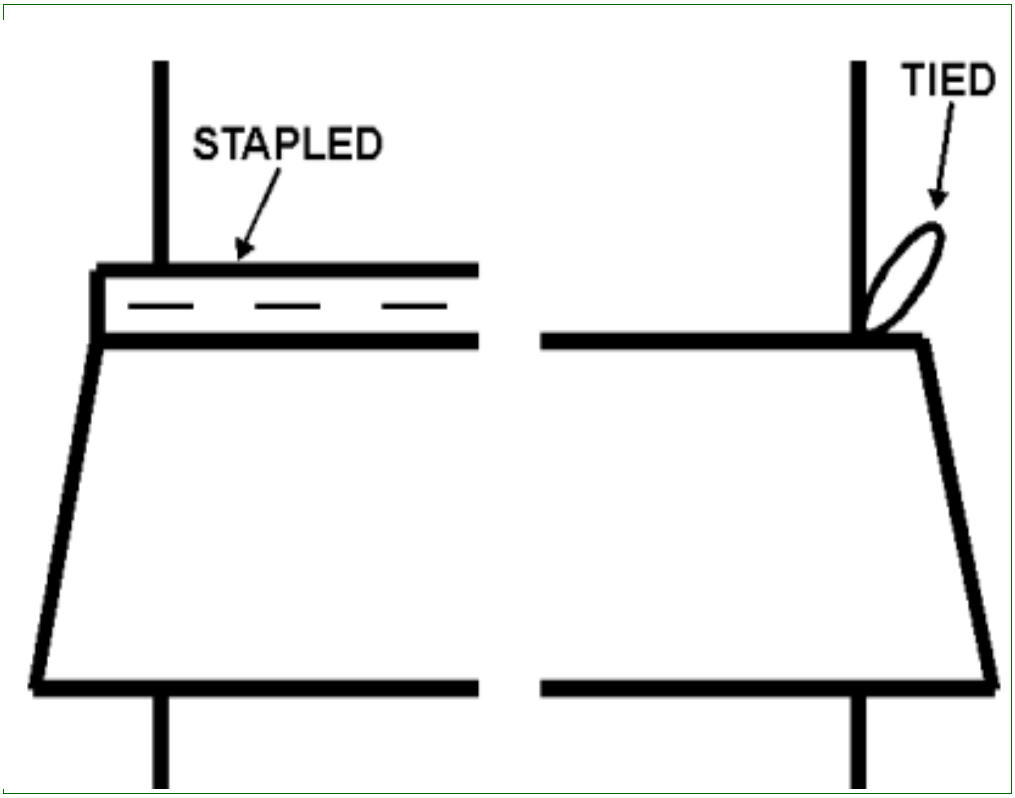

FIGURE 5-1: Example of a Larval Trap on a Host Tree

How to Trap

Place traps by stapling (or tying) at chest height the upper corners of pieces of tar paper or burlap to host trees to form a skirt. The burlap or tar paper should be at least 9 inches wide and long enough to go around the trunk of the tree. Make sure that the burlap or tar paper completely encircles the tree trunk but remains loose-fitting (See **Figure 5-1**). If white oak is present, use this tree for larval trapping.

Place the larval traps on the trunk of a tree shortly before egg hatch is predicted.

After larvae emerge, check under the burlap or tar paper for larvae and pupae. Larval traps should be checked two or three times a week. Larvae should be collected, identified, counted, and recorded by tree site.

For best results, check during daylight hours (preferably between 10 and 3) on hot, sunny days.

The larval traps should also be checked after the larval period because the larvae often pupate under the covering of the larval trap.